

## Claims

We claim:

1. A method for scanning for an object within a region, comprising:  
5 scanning the region using a conformal scanning scheme;  
determining one or more characteristics of the object in response to said scanning;  
and  
generating output indicating the one or more characteristics of the object.
- 10 2. The method of claim 1, further comprising:  
generating a conformal scanning curve based on a characteristic geometry of the  
region;  
wherein said scanning the region using a conformal scanning scheme comprises:  
measuring the region at a plurality of points along the conformal scanning  
15 curve.
3. The method of claim 2, further comprising:  
determining the characteristic geometry of the region prior to said generating the  
conformal scanning curve.  
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4. The method of claim 2, wherein said generating the conformal scanning  
curve comprises:  
performing a conformal mapping between said characteristic geometry and a first  
scanning curve to generate the conformal scanning curve.  
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5. The method of claim 4, wherein the first scanning curve minimizes one or  
more of angle deviations and curvature.

6. The method of claim 4, wherein the conformal curve has a maximum curvature below a specified curvature value.

7. The method of claim 4, wherein the first scanning curve is an optimum  
5 scanning curve for a first geometry.

8. The method of claim 4, wherein the first scanning curve is comprised in a first geometry, wherein the first scanning curve comprises a subset of points in said first geometry, and wherein said performing a conformal mapping between said characteristic  
10 geometry and said first scanning curve comprises:

determining a mapping function which maps each point in the first geometry to a corresponding point in the characteristic geometry; and

applying said mapping function to each point in said subset of points in said first geometry to generate a corresponding subset of points in said characteristic geometry,  
15 wherein said subset of points in said characteristic geometry comprises said conformal scanning curve.

9. The method of claim 2,  
wherein said measuring the region at a plurality of points along the conformal  
20 scanning curve produces data;

wherein said determining one or more characteristics of the object in response to said scanning comprises examining said data.

10. The method of claim 1,  
25 wherein said scanning the region using the conformal scanning scheme produces data indicative of the one or more characteristics of the object; and

wherein said determining one or more characteristics of the object in response to said scanning comprises examining said data.

11. The method of claim 1, wherein the region has a dimensionality of one of one, two, and three.

12. A system for scanning for an object within a region, comprising:  
5 a sensor; and  
a computer which is operable to couple to said sensor, said computer comprising:  
a CPU; and  
a memory medium which is operable to store a scanning program;  
wherein said CPU is operable to execute said scanning program to perform:  
10 scanning the region with said sensor using a conformal scanning scheme;  
determining one or more characteristics of the object in response to said  
scanning; and  
generating output indicating the one or more characteristics of the object.

13. The system of claim 12, wherein said CPU is further operable to execute  
said scanning program to perform:  
generating a conformal scanning curve based on a characteristic geometry of the  
region;  
wherein, in said scanning the region using a conformal scanning scheme, the  
20 computer is operable to execute one or more software programs to perform:  
measuring the region at a plurality of points along the conformal scanning  
curve.

14. The system of claim 13, wherein said CPU is further operable to execute  
25 said scanning program to perform:  
determining the characteristic geometry of the region prior to said generating the  
conformal scanning curve.

15. The system of claim 13, wherein, in said generating the conformal scanning curve, said CPU is further operable to execute said scanning program to perform:

performing a conformal mapping between said characteristic geometry and a first  
5 scanning curve to generate the conformal scanning curve.

16. The system of claim 15, wherein the first scanning curve minimizes angle deviations.

10 17. The system of claim 15, wherein the conformal curve has a maximum curvature below a specified curvature value.

18. The system of claim 15, wherein the first scanning curve is an optimum  
15 scanning curve for a first geometry.

19. The system of claim 13,  
wherein said measuring the region at a plurality of points along the conformal  
scanning curve produces data; and  
wherein said determining one or more characteristics of the object in response to  
20 said scanning comprises examining said data.

20. The system of claim 12,  
wherein said scanning the region using the conformal scanning scheme produces  
data indicative of the one or more characteristics of the object; and  
25 wherein said determining one or more characteristics of the object in response to  
said scanning comprises examining said data.

21. The system of claim 12, wherein the region has a dimensionality of one of  
one, two, and three.

22. The system of claim 12, wherein the region has a dimensionality greater than three.

23. A memory medium containing program instructions to scan for an object within a region, wherein said program instructions are executable to perform:

scanning the region using a conformal scanning scheme;

determining one or more characteristics of the object in response to said scanning;

and

generating output indicating the one or more characteristics of the object.

24. The memory medium of claim 23, wherein said program instructions are further executable to perform:

generating a conformal scanning curve based on a characteristic geometry of the region;

wherein said scanning the region using a conformal scanning scheme comprises:

measuring the region at a plurality of points along the conformal scanning curve.

25. The memory medium of claim 24, wherein said program instructions are further executable to perform:

determining the characteristic geometry of the region prior to said generating the conformal scanning curve.

26. The memory medium of claim 24, wherein said program instructions are further executable to perform:

performing a conformal mapping between said characteristic geometry and a first scanning curve to generate the conformal scanning curve.

27. The memory medium of claim 26, wherein the first scanning curve minimizes angle deviations.

28. The memory medium of claim 26, wherein the conformal curve has a  
5 maximum curvature below a specified curvature value.

29. The memory medium of claim 26, wherein the first scanning curve is an optimum scanning curve for a first geometry.

10 30. The memory medium of claim 24,  
wherein said measuring the region at a plurality of points along the conformal scanning curve produces data; and

wherein said determining one or more characteristics of the object in response to said scanning comprises examining said data.  
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31. The memory medium of claim 23,  
wherein said scanning the region using the conformal scanning scheme produces data indicative of the one or more characteristics of the object; and

wherein said determining one or more characteristics of the object in response to  
20 said scanning comprises examining said data.

32. The memory medium of claim 23, wherein the region has a dimensionality of one of one, two, and three.

25 33. The memory medium of claim 23, wherein the region has a dimensionality greater than three.